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AFRL demonstrates benefits of C-130 patch

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Vehicles Directorate (VA) worked with the North Carolina Air National Guard to demonstrate a life extending structural damping patch on an operational C-130.

The patch, created and installed by Damping Technologies, Inc., was made out of layers of aluminum and a viscoelastic material. For the demonstration, the patch was attached to a panel behind one of the C-130's engines. The directorate chose this panel because of its frequent cracking rate; it has required repair in approximately half of NCANG's C-130 fleet.

Before the demonstration, the Air Vehicles Directorate collected vibration and temperature data on the designated panel during five flights using an Air Force Research Laboratory-developed data acquisition system called the Damage Dosimeter. After the patch was applied, the directorate collected vibration and temperature data for seven additional flights. When engineers compared data from these two sets of flights, they found the patch decreased strain on the panel, indicating this patch could increase the life of the panel by 4.6 times.

VA plans to keep the patch on the C-130 for the remainder of its life for continual evaluation. Use of this patch has the potential to stop delays in development of fatigue cracking, which will decrease repair costs and increase operational readiness.

Fatigue cracking caused by vibration is common on most aging aircraft. Vibration is caused by energy being put into the aircraft panel through various sources, such as from turbulent airflow, high acoustic levels, or engine vibrations transmitted through the structure. A damping patch absorbs this vibrational energy, which decreases the amount the panel bends during each flight. @